

TEE Guided Removal of Renal Cell Carcinoma IVC Thrombus Extending Into The Right Atrium

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INTRODUCTION

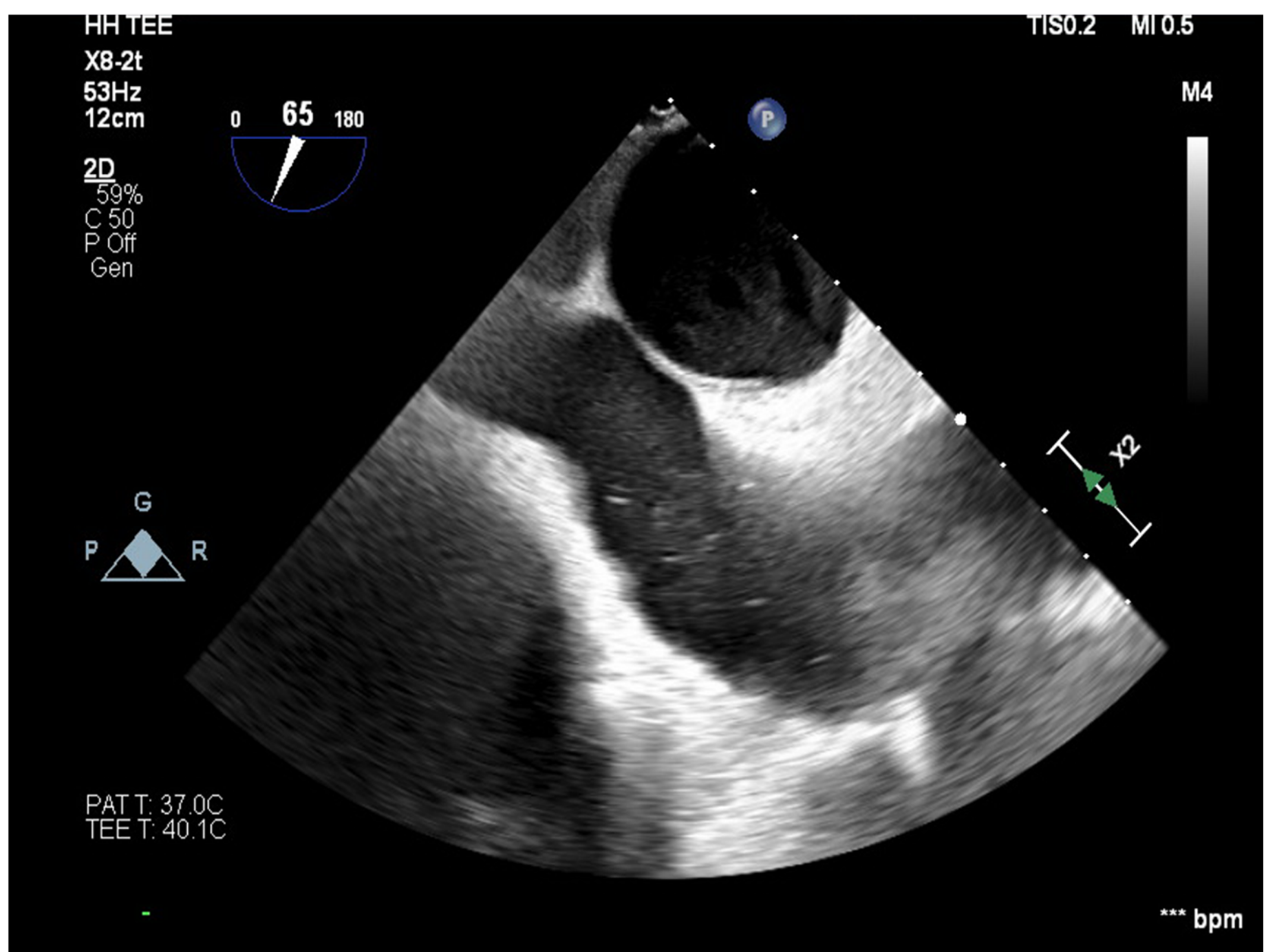
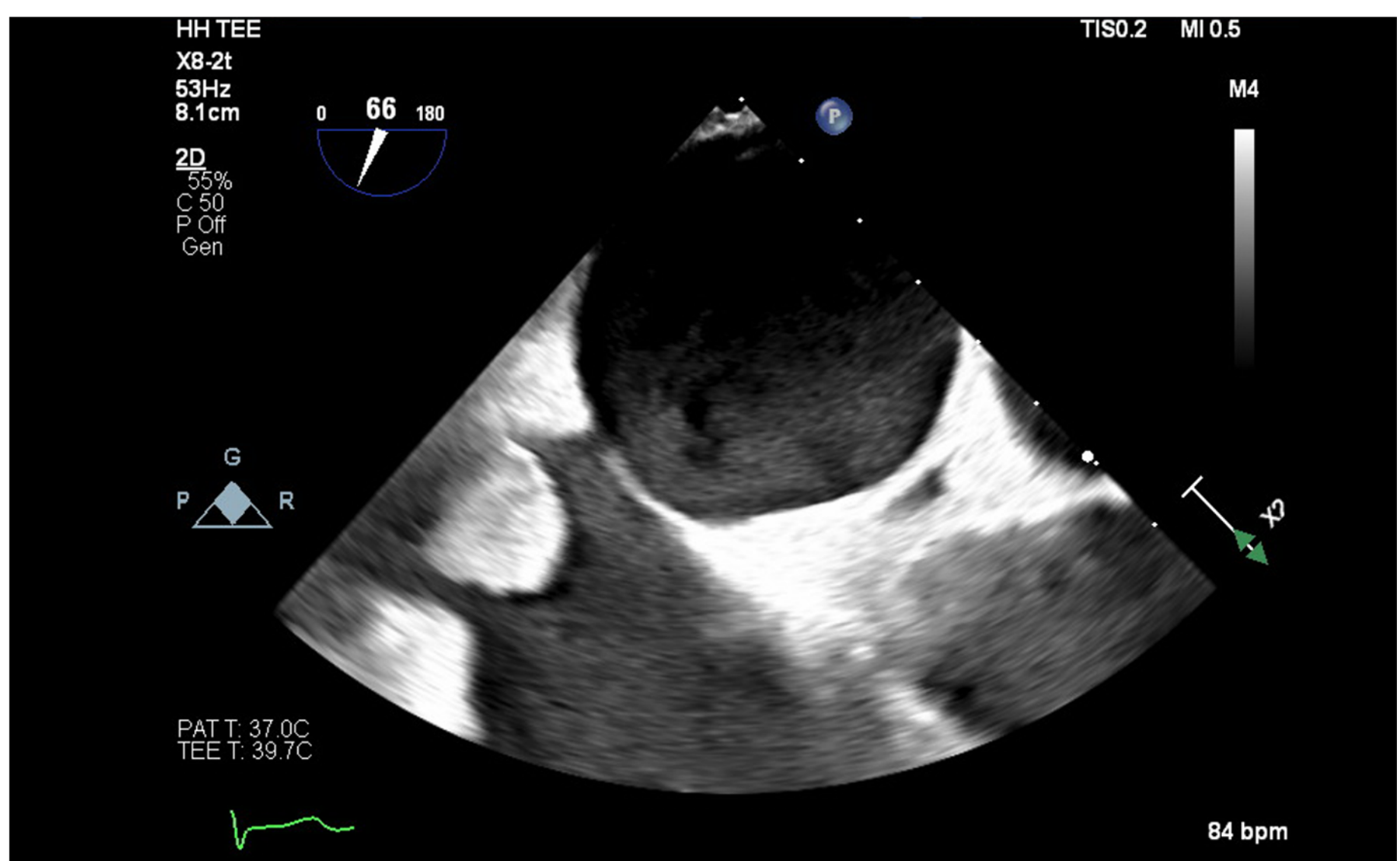
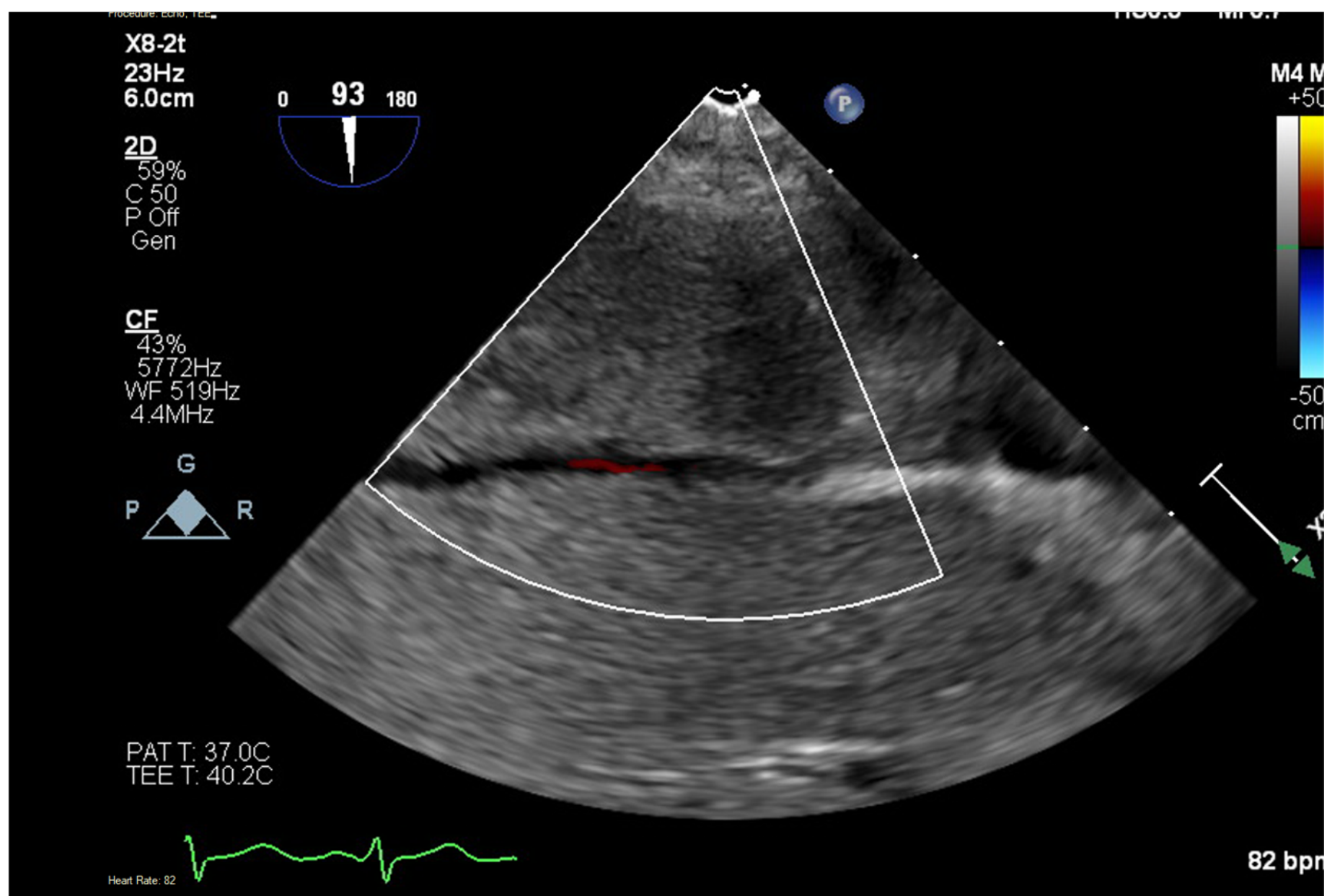
Renal cell carcinoma (RCC) is associated with tumor thrombus that extends from the renal vein to the IVC in 10% of cases, and to right atrium in 1% of cases. Surgical resection of thrombus with radical nephrectomy is the definitive cure. Operations involving supradiaphragmatic extension of the tumor thrombus often necessitate the use of cardiopulmonary bypass (CPB).

TEE can play a crucial role in determining the size and location of tumor thrombus as well as ensuring the entire tumor thrombus is removed. Here we present a case of a patient with a supradiaphragmatic RCC tumor thrombus who underwent radical nephrectomy with IVC thrombectomy without the use of CPB. Completion thrombectomy was aided with TEE guidance.

CASE REPORT

The patient was a 66 year old male with RCC who underwent a left radical nephrectomy with IVC thrombectomy and reconstruction. Preoperative MRI revealed a left kidney mass extending from the left renal vein to the cavoatrial junction and possibly within the right atrium.

Post induction TEE showed large tumor thrombus one centimeter distal to the cavoatrial junction with near occlusion of the IVC and dilated hepatic veins. The suprahepatic IVC was clamped with confirmation of clamp placement via TEE. Initial thrombectomy was performed via a cavotomy at the level of the left renal vein extending up to the hepatic junction. Subsequent TEE showed persistent tumor thrombus that had mobilized into the right atrium, requiring immediate surgical reintervention. Post thrombectomy TEE revealed no remaining tumor thrombus in the IVC or right atrium. The patient did not require CPB intraoperatively. He had an estimated blood loss of 5 liters and was transfused 10 units of PRBCs in addition to FFP, cryoprecipitate and platelets. Post operative pathology of the tumor thrombus showed clear cell RCC.



DISCUSSION

RCC with tumor thrombus extending to cavoatrial portion of the IVC is a complex surgery requiring expertise from urological, cardiothoracic and transplant surgeons, as well as an anesthesiologist who is able to perform and interpret TEE.

RCC tumor thrombus can be classified via a system from Level 1-4 depending on location. This patient had a Level 4 tumor, defined as tumor thrombus extending above the diaphragm. Frequently Level 3 (tumor thrombus extending above hepatic vein but below the diaphragm) and Level 4 tumors require the use of CPB due to risk of hemodynamic instability secondary to IVC cross clamping and bleeding. In this patient, surgeons were able to expose the cavoatrial junction through the abdominal incision and avoid the use of CPB.

In this patient, TEE was used to assess the extent of tumor burden in the IVC and to ensure that the entire tumor was removed. After initial thrombectomy at the level of the renal vein, it appeared that the tumor had mobilized and migrated proximal into the right atrium. This was immediately visualized on TEE and addressed via extension of the cavotomy and additional thrombectomy.

REFERENCES

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